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Improving On-Time Performance at Indonesia AirAsia through Ground Handling Optimization

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Abstract: On-time performance is a key indicator of airline operational efficiency and service quality, and it is especially strategic for low-cost carriers such as Indonesia AirAsia because it directly affects aircraft turnaround, cost control, and customer satisfaction. Previous studies have examined the determinants of on-time performance and the performance of individual ground handling roles, but few have linked a broader set of ground handling optimization strategies to on-time performance in an Indonesian low-cost carrier. This study aims to identify the factors that influence on-time performance at Indonesia AirAsia, to analyze the role of ground handling, and to examine optimization strategies that can improve it. A descriptive qualitative approach was applied using secondary data from company reports, scientific publications, and public performance reports, analyzed through literature review, document analysis, and a comparative case study of regional airlines. The results show that on-time performance and ground handling are closely interrelated, and that digitalization, competency-based personnel training, standardized service agreements with partners, and modernized ground support equipment are associated with higher punctuality. The novelty of this study lies in integrating these four optimization pillars into a single framework linked to on-time performance, offering a sustainable strategy for maintaining and improving punctuality.

Keywords: On-Time Performance, Ground Handling, Low-Cost Carrier, Indonesia AirAsia.

INTRODUCTION

The aviation industry is one of the most dynamic and strategic transport sectors, supporting public mobility, economic growth, and connectivity between regions and countries. Amid globalization, rising passenger numbers, and growing customer expectations, operational efficiency has become a central concern for airlines, particularly in ensuring that aircraft depart and arrive on schedule, a performance measure known as on-time performance (OTP).

OTP is more than an indicator of operational efficiency; it also reflects an airline's credibility and professionalism. In an increasingly competitive industry, OTP significantly influences customer satisfaction, passenger loyalty, and corporate image, because the higher an airline's OTP, the more the public perceives it as reliable. Under global industry standards, a flight is considered on time if it departs or arrives within 15 minutes of its scheduled time (Fitria Sari, 2018).

Indonesia AirAsia, part of the AirAsia Aviation Group, is a low-cost carrier (LCC) with a wide network of domestic and international routes and a reputation for service and cost efficiency. Like other airlines, however, it faces major challenges in maintaining and improving OTP amid complex operating conditions, congested air traffic, limited airport infrastructure, and changeable tropical weather. Cirium, a global OTP monitor, reported that the airline's OTP reached 86% in March 2024 but fell to 77.41% in November 2024 (Cirium, 2024). This decline signals the need to evaluate and optimize several operational aspects, including ground handling, which plays a vital role in the aircraft turnaround process.

Ground handling refers to the entire series of services provided to aircraft, crew, cargo, and passengers while the aircraft is on the ground, both before departure and after arrival (Budiasri et al., 2022). It covers passenger boarding and deboarding, baggage handling, refueling, cabin cleaning, cabin logistics loading, crew services, and departure coordination. Every second in this process directly affects departure time, so a delay in any single activity contributes to lower OTP. Delayed refueling, mismatched crew arrival times, obstructed baggage loading or unloading, and miscommunication between operational units are typical causes. In many cases, such problems stem less from external factors such as weather or air traffic than from inefficient time management and internal processes at the airline and its ground handling providers.

In Indonesia, ground handling is even more complex because several major airports, including Soekarno-Hatta (CGK), Ngurah Rai (DPS), and Juanda (SUB), have exceeded their ideal service capacity. This directly affects aircraft movement on the apron, limits the availability of gates and passenger boarding bridges, and requires much tighter coordination among airlines, airport authorities, and ground handling providers. The situation is aggravated by uneven service quality among third-party handlers, which do not always follow the standards and procedures set by the airline.

Some airlines have begun to apply real-time monitoring, operational digitalization, and data analytics to map delay patterns and identify bottlenecks in ground handling. AirAsia Group has also pursued initiatives such as switching off auxiliary power units on the ground and reducing ground emissions, aiming to improve both operational efficiency and environmental sustainability (AirAsia Newsroom, 2024). Even so, deeper and more strategic study is still needed to determine how far ground handling optimization actually contributes to higher OTP, especially in Indonesian operations.

Previous studies have examined the determinants of OTP at particular airports (Dewa et al., 2021; Siahaan et al., 2023), the relationship between OTP, flight frequency, and flight delays (Setiawan et al., 2021), quality control of OTP at an Indonesian airline (Arifianto & Dwiyanto, 2013), the relationship between OTP and load factor at Citilink (Ali et al., 2024), and the effect of ground handling and ramp dispatcher performance on OTP (Budiasri et al., 2022; Fauziah & Ramadhan, 2023). These studies, however, focus on specific determinants, airports, or ground handling roles. The research gap of this study therefore lies in the limited literature linking a broader set of ground handling optimization strategies to OTP in the context of an Indonesian LCC, particularly Indonesia AirAsia.

The novelty (state of the art) of this study lies in its integrated view of ground handling optimization. Rather than examining a single operational variable, it brings together digitalization and automation, personnel certification, integration of standard operating procedures (SOP) with partners, and equipment modernization, and it places these strategies in a comparative case study of Indonesia AirAsia against Citilink, Lion Air, and Batik Air.

METHODS

This study uses a descriptive qualitative approach that focuses on collecting data and narratively analyzing the processes and policies applied in ground handling management and

their relationship with OTP at Indonesia AirAsia. This approach was chosen because it allows the researcher to explore in depth the processes, obstacles, and strategies involved in airline operations.

The research object is Indonesia AirAsia, and the data are secondary data obtained from several sources: official documents and reports from AirAsia, including those available on the airline's official website; scientific articles and academic publications; public OTP reports from monitoring institutions such as Cirium and OAG; and earlier literature on flight operations management, ground handling, and airline performance. The data cover performance information reported for 2023 and 2024.

Data were collected through three techniques. The first was a literature study, which reviewed scientific and non-scientific sources on OTP and ground handling, including journals, books, news articles, and the airline's official website. The second was document analysis, which examined OTP performance reports, ground handling work procedures, and operational policies of Indonesia AirAsia related to time efficiency and ground services. The third was a case study, which centered the analysis on Indonesia AirAsia as the main object and compared its policies and actual practices with best practices in the industry.

The data were analyzed descriptively and narratively to answer each research question, and comparatively to contrast the ground handling strategies and OTP of Indonesia AirAsia with those of Citilink, Lion Air, and Batik Air.

RESULTS AND DISCUSSION

The Significance of On-Time Performance in the Airline Industry

OTP refers to the punctuality of aircraft departures and arrivals relative to the schedule (Ali et al., 2024). It is a primary performance indicator of an airline's operational efficiency and service quality: the higher the OTP percentage, the better the airline meets its planned schedule, which in turn benefits passenger satisfaction and airline image. Four dimensions describe OTP: the proportion of on-time departures, the percentage of on-time arrivals, the number of delayed flights, and the average delay duration. The first two show how consistently an airline keeps to its schedule, the third gives insight into the operational problems that need attention, and a shorter average delay duration indicates stronger OTP.

For Indonesia AirAsia, OTP is especially important because the LCC business model relies on high aircraft utilization and daily rotations. Turnaround times are short, typically 25 to 30 minutes, so refueling, baggage loading, and boarding must be efficient and coordinated (Fauziah & Ramadhan, 2023). Delays are therefore a systemic risk rather than a technical nuisance: a 30-minute delay on one route caused by ground handling disrupts the rotation of that aircraft on all subsequent routes, and this ripple effect can accumulate into cancellations or route diversions on the same day.

OTP also correlates strongly with customer perception. Cirium (2023) reports that airlines with consistently high OTP tend to receive fewer complaints and retain customers better. Because LCC passengers receive few extras such as lounges, meals, or in-flight entertainment, punctuality becomes an important differentiator. Skytrax (2023) lists punctuality among the main indicators passengers use to judge airline service, and Kementerian Perhubungan Republik Indonesia (2023) reports that 35% of complaints against domestic airlines relate directly to delays and flight time management. Consistent OTP also supports brand positioning against competitors such as Lion Air, Citilink, and Batik Air, and AirAsia has published its OTP on its official website and social media since 2022 as both transparency and image marketing (AirAsia Newsroom, 2024).

Factors Influencing On-Time Performance

The analysis identifies two groups of factors that influence OTP at Indonesia AirAsia. Internal factors are elements under the airline's direct control. The first is aircraft and crew readiness: delays in refueling or catering, or in crew who have just finished a previous duty, can seriously affect service to customers. The second is the ground handling process itself, including the speed and accuracy of baggage loading and unloading, punctual departure from the apron, and the effectiveness of coordination among divisions. The third is information technology and operations management: manual or poorly integrated scheduling systems often slow the response to operational changes and thus affect OTP.

External factors lie outside the airline's control. Airport congestion and slot times are one example, since at busy airports such as Soekarno-Hatta or Ngurah Rai a delay to one aircraft can create long queues on the apron. Adverse weather and force majeure, such as heavy rain, fog, or storms in tropical regions, are a second. Security and regulatory constraints, such as additional checks by authorities or sudden schedule adjustments, are a third. Determinants of this kind have also been studied at other Indonesian airports (Dewa et al., 2021; Siahaan et al., 2023). Because internal factors are directly controllable, they offer the main room for improvement, which is why ground handling becomes the focus of optimization.

The Role of Ground Handling in On-Time Performance

Ground handling covers the airline's handling of passengers and their baggage, cargo, mail, ground support equipment, and the aircraft itself while at the airport, for both departure and arrival, from the aircraft's arrival until it takes off again. Its services include handling of baggage, cargo, and cabin loads; provision of ground support equipment (GSE); passenger boarding bridges; ground technical services such as refueling, power units, and water filling; and coordination of flight documents (Fauziah & Ramadhan, 2023).

The efficiency of ground handling is closely and directly tied to turnaround time. Indonesia AirAsia relies on a short turnaround of around 25 minutes to sustain flight frequency and profitability, so a delay in one part of the process can disrupt the airline's entire daily schedule. Mahardika et al. (2024) found that ground time efficiency significantly affects OTP and that delays often originate in inefficient ground handling; they place ideal ground time at 30 to 40 minutes for domestic flights, depending on aircraft type and airport, while Indonesia AirAsia compresses it to 25 to 30 minutes as part of its LCC efficiency strategy. At this pace, precision, speed, and coordination are essential: if ramp service, baggage handling, fueling, and cleaning do not run in step, OTP suffers.

The literature and reports reviewed indicate that the most delay-prone part of the process is coordination among ground handling units, especially ramp dispatching and baggage loading that involve third parties. Maintaining synergy between the airline and third-party stakeholders is therefore vital to protecting OTP. Fauziah and Ramadhan (2023) provide quantitative support for this: ramp dispatcher performance, the main coordinator during aircraft handling, has a coefficient of determination (R^2) of 0.587 with OTP, meaning that 58.7% of the variation in OTP is explained directly by the performance of apron staff. The relationship between ground handling performance and OTP has likewise been tested at other airports (Budiasri et al., 2022).

Ground Handling Optimization Strategies at Indonesia AirAsia

The analysis identifies four groups of optimization strategies. The first is digitalization and automation. Indonesia AirAsia has developed the RedSmart and AirAsia MOVE platforms as tools for integrating operational systems (AirAsia Newsroom, 2023). This technology includes e-dispatching, which removes manual reporting to shorten communication time; baggage tracking based on radio-frequency identification (RFID), which reduces lost baggage and speeds up loading; and a turnaround control system that monitors all processes in real time

until the gate closes. The airline also uses a digital delay-reporting application that identifies bottlenecks in each sector quickly and allows immediate corrective action.

The second strategy is personnel development and certification. Improving OTP requires competent human resources, and Indonesia AirAsia consistently applies training systems based on International Air Transport Association (IATA) and IATA Safety Audit for Ground Operations (ISAGO) standards for ramp handlers, dispatchers, and apron teams. This role-based competency approach minimizes miscommunication and speeds up operational flow.

The third strategy is the integration of standard operating procedures across partners. Collaboration with ground handling providers such as Gapura Angkasa requires aligned SOP, so AirAsia prepares service level agreements (SLA) that set maximum times for baggage handling (under 15 minutes), refueling (under 10 minutes), and gate clearance (under 5 minutes). A system of penalties and rewards based on key performance indicators (KPI) makes collaboration among parties more accountable. In addition, at several main airports Indonesia AirAsia applies a vertical integration model in which ground handling is performed by internal units or affiliates such as Ground Team Red, which reduces dependence on third parties and enables tighter quality control.

The fourth strategy is the optimization of equipment and infrastructure. Indonesia AirAsia is gradually replacing its GSE with more efficient, environmentally friendly electric vehicles, and main airports such as Soekarno-Hatta, Juanda, and Kualanamu have been equipped with real-time GSE monitoring systems to avoid equipment queues and logistical bottlenecks.

Comparison with Other Regional Airlines

Comparing Indonesia AirAsia with Citilink, Lion Air, and Batik Air shows how different ground handling strategies relate to punctuality. Indonesia AirAsia targets a ground time of about 25 to 30 minutes, especially for its Airbus A320 fleet, which requires close cooperation among ramp dispatchers, baggage handlers, fuelers, and cleaning crews. Its vertical integration and its digital delay reporting, an approach not yet fully adopted by its regional competitors, support this efficiency. Citilink, a subsidiary of Garuda Indonesia, is less efficient in turnaround time but stands out for integrated digital systems across operational and ground service units that allow real-time tracking of ground handling. Its OTP was 78.9% according to Kementerian Perhubungan Republik Indonesia (2023), slightly below the 81.5% reported by AirAsia for the first quarter of 2024 (AirAsia Newsroom, 2024). This difference is partly explained by Citilink's reliance on external ground handling entities at several regional airports, which causes variability in service quality.

Lion Group, which houses Lion Air and Batik Air, often struggles with the consistency and standardization of ground handling. According to the Airport Statistics Report (2023), Lion Air's OTP averages only 68%, while Batik Air is somewhat better at around 73%. The main problems are heavy dependence on external ground handling partners, communication systems that are not yet integrated among flight crew, dispatchers, and airport parties, and high flight frequency that is not matched by adequate ground handling capacity. As a result, delays caused by ground processes remain a dominant factor in their OTP. Table 1 summarizes the comparison.

Table 1. Comparison of OTP and Ground Handling Strategies of Indonesian Airlines

Airline	Average OTP	Ground Handling Strategy	Strengths	Weaknesses
Indonesia AirAsia	81.5%	Vertical integration (through Ground Team Red)	High efficiency Digitalized systems Periodically trained personnel	Reliance on several partners at non-hub airports

		Digital delay reporting Turnaround under 30 minutes		
Citilink	78.9%	Collaboration among internal units Digital real-time monitoring system	Good operational data connectivity Integrated reporting system	Third parties still used at small airports
Batik Air	73%	Outsourced ground handling Conventional coordination among teams	Flexible organizational structure	Limited digitalization High service variability
Lion Air	68%	Extensive outsourcing Focus on high frequency	Low operating costs	Non-standard ground handling Limited training of apron personnel

Source: Author's analysis of secondary data (AirAsia Newsroom, 2024; Kementerian Perhubungan Republik Indonesia, 2023; Airport Statistics Report, 2023).

Impact of Optimization on On-Time Performance

Company data suggest that optimization is associated with better OTP. AirAsia Newsroom (2024) reports that after several ground handling optimization measures, including personnel training, renewal of GSE, and digitalization of scheduling systems, the OTP of Indonesia AirAsia rose from 76.2% at the end of 2023 to 81.5% in the first quarter of 2024. An increase of more than five percentage points in under six months indicates that ground handling optimization contributes tangibly to punctuality. Three measures were reported as particularly effective: RFID baggage tracking, which reduces search time and prevents delays from reloading; the replacement of fuel-powered handling vehicles with electric ones, which speeds up mobility without major mechanical disruption; and the training and re-certification of field personnel, especially dispatchers and loaders, which improves communication and procedural accuracy.

Better punctuality also reduces costs. Delays lead to compensation for passengers, extra fuel consumption from holding or longer taxi times, and crew replacement costs when duty limits are exceeded, and the effect of delays on the operating costs of domestic airlines has been examined by Gunawan and Dwi (2023). An internal report of Indonesia AirAsia records that each 15-minute delay on a flight can cost roughly USD 800 to 1,000, depending on aircraft type and route. With an average of 150 daily flights, a 5% improvement in OTP could save hundreds of thousands of dollars per month. Because these figures come from company-published sources, they should be read as reported values rather than independently verified results.

Passenger satisfaction and loyalty are affected as well. In an early-2024 AirAsia customer survey, 82% of respondents were satisfied with flight punctuality, up from 69% in mid-2023. Satisfaction is positively related to loyalty and repeat purchase, which matters greatly in the LCC model, where profitability depends not only on low fares but also on reliable service (see also Paulalengan et al., 2016, on passenger satisfaction with AirAsia).

Efficient ground handling also has a multiplier effect on the rest of the operational chain. Punctual departures let crews finish duties within legal duty time without replacement or extension, which improves crew scheduling. Aircraft utilization per day rises, so more sectors can be flown without enlarging the fleet. Slot time management improves as well, because major airports have strict slots and a delay in one slot can cause losses or even the long-term loss of operating permission. Ground handling optimization is thus not only about improving

daily performance but also a strategic investment in strengthening the airline's operational structure.

Challenges and Mitigation

Implementation is not free of challenges. Personnel numbers and competence are limited at secondary airports, aircraft rotations are delayed by earlier routes, and dependence on third parties remains high wherever ground handling is not done in-house. To address them, Indonesia AirAsia needs to develop an operational audit system and benchmarking among airports so that policies fit local characteristics. OTP-based performance incentives for ground handling personnel are also advisable to raise their sense of ownership and responsibility.

The novelty of this study is that it shows ground handling optimization at Indonesia AirAsia to be an integrated strategy rather than a single technical fix. The reported improvement in OTP coincided with four mutually reinforcing pillars, namely digital monitoring, competency-based personnel development, SLA-based partner integration, and modernized equipment, and the comparison indicates that airlines with higher integration and digital reporting, such as Indonesia AirAsia and Citilink, record higher OTP than airlines that rely heavily on outsourced and less standardized ground handling, such as Batik Air and Lion Air. The findings thus combine technology, human resources, operational partnerships, and a time-oriented work culture into one explanation of how an Indonesian LCC can raise and sustain punctuality.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

In answer to the first research question, OTP at Indonesia AirAsia is shaped by internal factors, namely aircraft and crew readiness, the ground handling process, and information technology and operations management systems, and by external factors, namely airport congestion and slot times, adverse weather, and security and regulatory constraints. Because the internal factors are within the airline's control, they represent the main opportunity for improvement.

In answer to the second research question, ground handling plays a strategic and determining role in OTP. With a turnaround time of only 25 to 30 minutes, every ground activity, from refueling and baggage handling to cabin cleaning and boarding coordination, must be precise and synchronized, because a delay in one activity disrupts the following rotations. Earlier evidence that ramp dispatcher performance explains 58.7% of the variation in OTP supports this role.

In answer to the third research question, four optimization strategies can be applied: digitalization and automation, competency-based training and certification, SOP integration and service level agreements with partners, and modernization of ground support equipment. Their implementation coincided with a reported rise in OTP from 76.2% to 81.5%, alongside lower delay costs, higher passenger satisfaction, better aircraft utilization, and smoother crew scheduling. Overall, the improvement of OTP at Indonesia AirAsia results from the strategic integration of technology, human resources, operational partnerships, and a work culture oriented to efficiency, and this finding contributes to the literature on aviation operations management in the Indonesian LCC context.

Limitations

This study has several limitations. First, it relies entirely on secondary data, much of it published by the airline and industry monitoring bodies, so the figures could not be independently verified and the reporting periods of the airlines compared are not fully identical. Second, the descriptive qualitative design does not allow the causal effect of each optimization

measure on OTP to be tested statistically. Third, the case focuses on Indonesia AirAsia and three other airlines, so the findings cannot yet be generalized to all airlines or airports.

Recommendations

Based on the findings, Indonesia AirAsia is advised to pursue several strategic actions. It should establish an integrated Hub Control Center at its main airports, with Soekarno-Hatta as the pilot location, to monitor all turnaround processes in real time and to integrate flight data monitoring, predictive delay algorithms, and automated incident response. It should review its schedule structure and allocate strategic buffer time at congested and weather-prone airports, and position standby aircraft at selected locations as a quick mitigation for technical delays. It should strengthen synergy with airport authorities such as Angkasa Pura I and II and with ground handling providers by updating service level agreements to align OTP targets, holding routine operational coordination forums, and sharing real-time data on aircraft parking schedules, equipment availability, and departure status.

The airline is also advised to invest in electric or hybrid ground support equipment with automation, such as electric belt loaders, automated baggage tugs, and modern ground power units, supported by sensors and predictive maintenance to avoid sudden equipment failures. It should keep investing in personnel competence through training based on IATA and ISAGO standards, certification for ramp staff, loaders, and dispatchers, and soft-skill development in field leadership, pressure management, and cross-unit coordination, together with rotation and OTP-based incentives. It should develop data-driven decision making with big data analytics and machine learning to predict delays, allocate crews and aircraft dynamically, and recommend gate or rotation adjustments. Finally, it should form an internal OTP audit unit that reports monthly on the dominant causes of delay, short- and long-term mitigation, and the effectiveness of policies and SOP.

Future studies should complement this secondary-data approach with primary data such as interviews and field observation at the apron, extend the comparison to more airlines and airports, and use quantitative or longitudinal methods to test the effect of each optimization pillar on OTP.

Author Contributions

The author was solely responsible for the conceptualization of the study, data collection, data analysis, interpretation of the results, manuscript preparation, scholarly revision, and final approval of the manuscript for publication. The author has read and approved the final version of the article.

AI Disclosure Statement

While drafting this manuscript, the author used [Name of AI Tool/Service] for [purpose of use, e.g., grammar editing/translation]. The author has thoroughly reviewed and edited the content and takes full responsibility for the entire content of this publication. (If using AI): The author declares that this research manuscript was prepared, researched, written, and edited independently without the use of artificial intelligence (AI) technology or techniques. (If NOT using AI):

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